



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,064	07/25/2001	Takahiro Oka	TAI 129	3312
23995	7590	06/21/2004	EXAMINER ERDEM, FAZLI	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			ART UNIT 2826	PAPER NUMBER

DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/912,064

Applicant(s)

OKA ET AL.

Examiner

Fazli Erdem

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4 and 8-20 is/are rejected.
- 7) ☒ Claim(s) 5-7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 06/02/2004, with respect to the rejection(s) of claim(s) 1-20 under 103(a) have been fully considered and are persuasive. Therefore, the final rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of prior art provided below.

Allowable Subject Matter

2. Claims 5,6 and 7 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:
Prior art failed to establish the required sunken region on the substrate.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1,4, 9, 11, 17, 18 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Tzu (6,201,302) in view of Rolda, Jr. et al. (2002/0030261).

Regarding Claims 1,4, 9, 11, 17, 18 and 20, Tzu discloses semiconductor package having multi-dies where in Fig. 3, semiconductor dies 306 and 312 are mounted on the substrate 302 on a reverse manner with wiring 310 connecting the semiconductor dies to the substrate. As the figure shows the semiconductor substrate 302 has an opening larger than the lower die 312 but smaller than the upper die 306. Tzu fails to disclose the required insulating interposer between the two dies. However, Rolda, Jr. et al. disclose a multi-flip-chip semiconductor assembly where in Fig 1, the element 12 that is between the semiconductor chips 110 and 130 is an insulating interposer.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required insulating interposer between the upper and the lower semiconductor dies in Tzu as taught by Rolda, Jr. et al. in order to have a semiconductor packaging structure with higher reliability.

4. Claims 3, 8, 10, 12, 13, 14, 15, 16 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Tzu (6,201,302) in view of Rolda, Jr. et al. (2002/0030261) further in view of Tao et al. (6,118,176)

Regarding Claims 3, 8, 10, 12, 13, 14, 15, 16 and 19, Tzu discloses semiconductor package having multi-dies where in Fig. 3, semiconductor dies 306 and 312 are mounted on the substrate 302 on a reverse manner with wiring 310 connecting the semiconductor dies to the substrate. As the figure shows the semiconductor substrate 302 has an opening larger than the lower die 312 but smaller than the upper die 306. Tzu fails to disclose the required insulating interposer between the two dies and the required adhesive

sheet. However, Rolda, Jr. et al. disclose a multi-flip-chip semiconductor assembly where in Fig 1, the element 12 that is between the semiconductor chips 110 and 130 is an insulating interposer. Furthermore, in Fig. 4 of Tao et al. the elements 404 and 405 are adhesive layers.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required insulating interposer between the upper and the lower semiconductor dies and the adhesive layer in Tzu as taught by Rolda, Jr. et al. and Tao et al. respectively, in order to have a semiconductor packaging structure with higher reliability.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (571) 272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FE

June 17, 2004